CLAIMS:

1. A passive optical transceiver for receiving a first optical signal stream and transmitting a second optical signal stream, including:
a photodetector for detecting a first portion of said first stream; and
an optical modulator for modulating a second portion of said first stream to provide said second stream;
wherein said streams are colinear with said photodetector and said modulator.

2. A passive optical transceiver, as claimed in claim 1, including a port for receiving said first optical signal stream and transmitting said second optical signal stream.

3. A passive optical transceiver, as claimed in claim 1 or 2, including means for reflecting a portion of said first optical signal stream to said optical modulator to provide said second stream.

4. A passive optical transceiver, as claimed in claim 3, wherein said reflected portion is a constant part of the power of said first optical signal stream.

5. A passive optical transceiver, as claimed in claim 3, wherein said first portion of said first signal stream has a first wavelength and said second portion of said first signal stream has a second wavelength, and said reflecting means operates on the basis of wavelength division.

6. A passive optical transceiver, as claimed in claim 3, wherein said reflecting means is switchable to reflect a portion of said first stream on the basis of time division.

7. A passive optical transceiver, as claimed in claim 1, wherein said modulator is switchable to modulate a portion of said first stream on the basis of time division.

8. A passive optical transceiver, as claimed in any one of claim 3, wherein said first signal passes through said modulator in a first direction, and the reflected portion of

said first signal passes through said modulator in a second direction, and said modulator passes said first signal in said first direction substantially unmodulated.

9. A passive optical transceiver, as claimed in claim 8, wherein said modulator includes arms for splitting said first optical signal stream into split signal streams, phase shifting at least one of the split signal streams, independently transporting the split signal streams for detection at spatially distinct locations, and detecting said first optical signal stream substantially independent of said phase shifting.

10. A passive optical transceiver, as claimed in claim 9, wherein said split signal streams are detected at spatially distinct locations of said photodetector.

11. A passive optical transceiver, as claimed in claim 9, wherein each of said split signal streams is detected by a respective photodetector.

12. A passive optical transceiver, as claimed in any one of claims 9 to 11, wherein said modulator includes a first arm for inducing a positive phase shift, and a second arm for inducing a negative phase shift.

13. A passive optical transceiver, as claimed in claim 8, wherein said modulator operates on the basis of a difference in polarisation between said first optical signal stream and said reflected portion.

14. A passive optical transceiver, as claimed in claim 13, wherein said modulator is an electro-optic modulator, and said transceiver includes a polarisation element located between said modulator and said reflecting means, said polarisation element rotating the polarisation vector of said first optical signal stream and said reflected portion by 45°.

15. A passive optical transceiver, as claimed in claim 1, wherein said modulating includes overmodulating a second signal onto said second portion of said first optical signal to provide said second optical signal.

16. A passive optical transceiver, as claimed in claim 15, wherein said first optical signal includes first data encoded by modulation between a first non-zero intensity and a second non-zero intensity, and said overmodulation includes attenuating the intensity of said second portion between a first attenuation value and a second attenuation value, said attenuation values chosen so that their ratio is different from the ratio of said first and second intensities.

17. A passive optical transceiver, as claimed in claim 16, wherein said second non-zero intensity is a substantial fraction of said first non-zero intensity, and said second attenuation value is substantially complete attenuation.

18. A passive optical transceiver, as claimed in any one of claims 15 to 17, wherein the frequency of said overmodulation is substantially greater than the frequency of said modulation of said first data.

19. A passive optical transceiver, as claimed in claim 18, wherein said frequency of said overmodulation is chosen to effect dither modulation to reduce interference effects in said second optical signal stream.

20. A passive optical transceiver, as claimed in any one of claim 1, wherein said modulator modulates said first optical signal stream, and said transceiver includes means for removing the modulation applied to said first optical signal from a corresponding electronic signal generated by said photodetector.

21. A passive optical transceiver, as claimed in claim 1, wherein said photodetector is partially transparent and allows said second portion of said first optical signal stream to pass through said photodetector to provide said second stream.

22. An optical transceiver including:
an input/output port for receiving a first optical signal stream and transmitting a second optical signal stream;
a photodetector;

an optical modulator for passing said streams and for modulating said second stream in response to a modulation signal; and

a reflector for passing said first stream for detection by said photodetector and for partially reflecting said first stream to said optical modulator to provide said second stream.

23. An optical transceiver as claimed in claim 22, wherein said first stream is in one direction and said second stream is in an opposite direction.

24. A passive optical transceiver, including an optical modulator, a partially reflective mirror, and a photodetector, said mirror, modulator and photodetector arranged to be substantially coaxial with the axis of light propagation through said transceiver, and configured so that light entering the transceiver passes through the modulator to the mirror, where a portion of said light is transmitted through the mirror to the photodetector, and another portion of said light is reflected by the mirror, is modulated by the modulator, and is transmitted from said transceiver.

25. A passive optical transceiver as claimed in claim 24, wherein said mirror, modulator and photodetector are substantially coaxial with the axis of light propagation through said transceiver.

26. A method of encoding second data onto an optical stream encoded with first data, including:

receiving said optical stream encoded by modulating its intensity between a first non-zero intensity and a second non-zero intensity on the basis of said first data; and

encoding said second data onto said optical stream by further modulating said optical stream by attenuating its intensity between a first attenuation value and a second attenuation value, said attenuation values chosen so that their ratio is different from the ratio of said first and second intensities.

27. An optical network including at least one optical transceiver as claimed in any one of claims 1 to 25.

28. A point to point optical network having passive optical transceivers, as claimed in any one of claims 1 to 25, connected to active optical transceivers in a central hub.

29. A point to point optical network having active optical transceivers connected to passive optical transceivers as claimed in any one of claims 1 to 25, wherein said passive optical transceivers are in a central hub.

30. A computer bus architecture having at least one optical transceiver as claimed in any one of claims 1 to 25.

31. A computer bus architecture with an optical network as claimed in any one of claims 27 to 29.